COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
SOUTHWEST REGIONAL OFFICE
355 Deadmore Street, PO Box 1688, Abingdon, Virginia 24212
Phone (276) 676-4800 Fax (276)676-4899
www.deq.virginia.gov

Douglas W. Domenech
Secretary of Natural Resources

David K. Paylor
Director

Dallas R. Sizemore
Regional Director

May 21, 2010

Mr. David N. Smith
Director of Environmental, Health and Safety Services
Old Dominion Electric Cooperative
Innsbrook Corporate Center
4201 Dominion Boulevard
Glen Allen, VA 23060

Location: Surry County
Registration Number: 52272

Dear Mr. Smith:

As our analysis of the December 2008 air quality permit application and addendum information regarding the Cypress Creek Power Station continues, we have developed additional questions and have identified areas where more information is required. These questions and items are in addition to those matters discussed in our letter of March 24, 2010. We request you address and respond to each item below.

PSD miscellaneous

- Recent permits for pulverized coal boilers have been for units designed and now operating that are apparently capable of utilizing a combination of coal fuel types in varying operating modes. We request that you provide the specific design details of the main Cypress Creek boilers that would preclude use of other coals (e.g., Powder River Basin) in favor of Central Appalachian Bituminous. Additionally, we request a detailed discussion of elements (other than transportation reliability) that were considered when making the selection of Central Appalachian Bituminous coal as an inherent component of the proposed project.
- The carbon monoxide and volatile organic compound emission rates discussed in the application for co-firing biomass and coal are not proportionally related to the emission rates for firing only coal. We request a detailed discussion of the elements (other than general uncertainty) that were considered when developing the proposed co-firing emission estimates.

- Provide an expanded discussion of the bottom ash and gypsum handling/storage processes, including details and information to support the claim why handling "wet" or inherently moist material should be considered equivalent in terms of BACT requirements to fabric filter control.
- Provide clarification as to whether the biomass transfer tower is the same as the coal transfer tower and if not, confirm that the biomass tower will have its own dust collection and control system.
- Provide an expanded discussion of the biomass storage processes, including details and information to support the claim why BACT for stockpiles requires no specific control techniques or technology.
- The proposed opacity limit for the auxiliary boiler is not reflective of historical BACT requirements for similar oil-fired units. Provide a detailed BACT analysis that justifies a 20/27 percent opacity limitation.
- Regarding the concentration and mass emission rate for ammonia slip, provide a projection of ammonia concentration at the fenceline by modeling or other appropriate method. Discuss the odor impact of ammonia at the plant's fenceline.
- Provide the plant's water uptake and return rates (water balance) from the James River in millions of gallons per day.
- Provide information about the water treatment processes that are to be used at the facility, including details about types and usage rates of treatment chemicals and additives and provide information about the types of process heaters, reaction units, and material handling processes, if any.
- Confirm that the 2-gallon per minute cooling tower drift loss estimate is representative of anticipated operating conditions.
- A *fugitive coal dust emissions control plan* is required, in accordance with the requirements of NSPS subpart Y at 40 CFR 60.254(c).
- Provide a Material Safety Data Sheet (MSDS) or product specification sheet for the sorbent used to control sulfuric acid emissions.
- Provide on Form 7 page 12 the design and actual air pollution control efficiencies for all control devices.
- Update Form 7, page 2, by marking the appropriate box to indicate application is also being made for an Article 6 permit.

MACT-related

- Specify the type of mercury sorbent to be used and provide a MSDS or product specification sheet for that sorbent.
- The proposed Industrial, Commercial and Institutional Boilers and Process Heaters NESHAP, 40 CFR 63, Subpart DDDDD has been signed by the EPA Administrator and will be published in the Federal Register. Your application should be amended to reflect the requirements of the proposed MACT.
- Evaluate injecting mercury sorbent prior to the air heater as a possible way to increase mercury capture.
- In order for DEQ to consider using SO_2 as a surrogate for acid gases, the relationship between control of SO_2 and the acid gases must be shown and

demonstration made that the emissions of HCL, HF, and HCN would be equivalent to the best-controlled similar source for these pollutants.

- In the MACT analysis, a higher short-term 24-hr average limit for mercury was proposed. The emission limit for mercury includes a variability and uncertainty factor and will be a 12-month rolling average. This approach should enable the operator to meet the limit at all times during normal operation, including startup and shutdown. In consideration of the inappropriateness of the higher short-term limit, revision of the analysis is requested.
- When considering variability and uncertainty, only data from the best-controlled similar source should be included. You should revise your application accordingly.
- Evaluate an end-of-line wet ESP for a potential beyond-the-floor technology for mercury and other volatile and semi-volatile metal HAPs.
- Provide separate analyses for dioxins/furans and for the metal HAPs (antimony, chromium (VI), cobalt, and selenium) that your application shows would not be captured by the proposed suite of controls.
- It is anticipated that EPA will soon post results from stack tests submitted by facilities as part of the ICR for the Utility MACT. DEQ will continue to review stack test reports for hazardous air pollutants as they become available. If these results show a better-controlled similar source for any pollutant, a revised application will be required.

BACT - sulfur dioxide emissions

- In Section 3.2.2.3 of the February 2010 BACT Analysis, reference was made to "bituminous fuel with a sulfur content of less than or equal to 2 lb SO_2/MMBtu." However, in Appendix E of the February 2010 BACT Analysis, a statement was made that Coal Information Summary data was not intended to reflect any limitations or limits on the fuel that may be fired. Is ODEC proposing coal with sulfur content equivalent to 2 lb SO_2/MMBtu or less as a short and/or long term operating limit on the PC boilers? If not, is ODEC proposing any limitation on the short and/or long term sulfur content of the coal for the PC boilers?
- In Section 3.2.2.4 of the February 2010 BACT Analysis, there was a limited discussion of wet FGD design characteristics. The section concluded "...SO_2 removal performance is expected to be equal and have comparable cost effectiveness. Therefore, wet FGD systems will be evaluated collectively." However, footnote 6 to Table 3-4 referred to high efficiency wet FGD systems that can achieve SO_2 outlet concentrations as low as 10 ppm or 99 percent control. These wet FGD systems were then dismissed as "not feasible" due to the lack of long-term performance data. Explain this apparent discrepancy (all wet FGD is the same vs. some wet FGDs can achieve very high efficiency). Also, any technologies (and their associated emission reduction performance) that were excluded from the analysis as "not feasible" must be clearly identified and the justification for their exclusion must be clearly documented.

- Section 3.2.4 of the February 2010 BACT Analysis identified the two top ranked SO_2 control combinations as fuel switching plus wet FGD and coal cleaning plus wet FGD. These two options were then eliminated from consideration as BACT based on their economic impacts. However, it appears that the economic evaluation of these two options was limited to their incremental cost effectiveness. The analysis of the economic impact from these two options should also include the calculation and consideration of their average cost effectiveness. Also, footnote C of Table 3-6 assumed a fuel cost increase of 8% for low sulfur Central Appalachian fuel. The calculation and basis for this 8% figure should be documented in detail. Similarly, the cost estimates for the coal washing option should be documented in detail.

BACT - particulate matter (PM) emissions

- Section 3.3.4 of the February 2010 BACT Analysis identified the two top ranked PM control combinations as the combination of sorbent injection, fabric filter and wet FGD upstream of a WESP and the combination of a dry FGD, fabric filter and wet FGD. These two options were then eliminated from consideration as BACT based on their economic impacts. However, it appears that the economic evaluation of these two options was limited to their incremental cost effectiveness (i.e. the tons of pollution reduced by the addition of a WESP divided by the cost of the addition of a WESP). The analysis of the economic impact from these two options should also include the calculation and consideration of their average cost effectiveness (i.e. the total tons of pollution reduced by the control system divided by the cost of the control system). Also, the control technology costs for these two options in Table 3-14 were described as being based on internal estimates. The calculation and basis for these estimated costs should be documented in detail. Any additional cost estimates generated for the requested average cost-effectiveness evaluation should be similarly detailed.
- In Section 3.3.5.2 of the February 2010 BACT Analysis, there was a discussion of stack test data from A.B. Brown Unit 1 and F.B. Culley Generating Station Unit 3. In particular, the results of one stack test for each unit were referenced. Clarify whether any additional stack test data was received or is now available for either facility, and if so, provide the results of such tests.

BACT - nitrogen oxide (NO_x) emissions

- Attachment 4 of the February 2010 application supplement lists an uncontrolled NO_x emission rate of 0.3 lb/MMBtu. The reference for this value stated that it was based on the worst-case 1-hour NO_x emission rate. However, no explanation was provided for the worst-case 1-hour NO_x emission rate. Fully describe the calculation of the uncontrolled NO_x emission rate including any underlying data. Also, indicate whether the uncontrolled emission rate included the impact of proposed low-NO_x burners

and overfire air systems. If not, provide the "boiler out" NO_x emission rate with similar documentation.

- Recent permits issued for PC boilers (Desert Rock and Plant Washington) have included requirements for significantly lower NO_x emission limitations than those proposed in the February 2010 BACT Analysis. Describe any factors that would prevent the proposed Cypress Creek PC boilers from being designed to achieve, and capable of actually achieving similarly low emission rates.
- The Coal Conversion Technology Assessment provided in the February 2010 application supplement included a projected actual NO_x emission rate of 0.04 lb/MMBtu. Although not proposed as a limit in the NO_x BACT analysis, provide the basis for this projection.

BACT – sulfuric acid mist (SAM) emissions

- Section 3.6.3 of the February 2010 BACT Analysis identified the two top ranked SAM control combinations as the combination of dry FGD, fabric filter and wet FGD and the combination of sorbent injection, fabric filter, wet FGD and WESP. These two options were then eliminated from consideration as BACT based on their economic impacts. However, it appears that the economic evaluation of these two options was limited to their incremental cost effectiveness (i.e. the tons of pollution reduced by the addition of a WESP divided by the cost of the addition of a WESP). The analysis of the economic impact from these two options should also include the calculation and consideration of their average cost effectiveness (i.e. the total tons of pollution reduced by the control system divided by the cost of the control system). Also, the control technology costs for these two options in Table 3-21 were described as being based on internal estimates. The calculation and basis for these estimated costs should be documented in detail. Any additional cost estimates generated for the requested average cost-effectiveness evaluation should be similarly detailed.

BACT - fluoride emissions

- In Section 3.8.2 of the February 2010 BACT Analysis, WESPs were eliminated from further consideration, however, fabric filter baghouses and ESPs were retained. Explain this apparent discrepancy.
- Attachment 4 of the February 2010 application supplement indicated an uncontrolled fluoride emission rate of 0.0057 lb/MMBtu and a control efficiency of 87.7%. These values appear to differ from those presented in Section 3.8 of the February 2010 BACT analysis. Explain these apparent discrepancies. Also, fully describe the calculation of the uncontrolled fluorides emission rate including any underlying data.
- Section 3.8.5 of the February 2010 BACT Analysis specified BACT for fluorides as the combination of sorbent injection, a fabric filter baghouse, and a wet FGD. The control efficiency attributed to this combination is 96%. This appears to be based on 94% from the wet FGD scaled up by 30% for the

additional presence of the sorbent injection/FF combination. It also appears that the 94% wet FGD figure is based on a generic 2002 report. Provide a current, site-specific analysis of the emission performance of the control technologies proposed as BACT for fluoride emissions.

BACT - general

- In the February 2010 BACT Analysis, the BACT emission limitations for PM, NO_x, CO and VOC proposed in Step 5 of their respective analyses were specified to "...include all periods the boiler is in operation." Clarify whether a similar statement is intended to apply to the proposed BACT emission limitations for SO_2, sulfuric acid mist, fluorides, and lead.

If you have questions or require clarification about any of the items in this letter, please direct inquiries to the appropriate individuals, as outlined below:

MACT-related	Patricia Buonviri	(804) 698-4016
BACT-related	Stanley Faggert	(804) 527-5078
Miscellaneous	Rob Feagins	(276) 676-4835

Sincerely,

Rob Feagins
Air Permit Manager
DEQ Southwest Regional Office

c: Mike Murphy, Director Piedmont Regional Office
Tamera Thompson, Director Office of Air Permit Programs
James Kyle, Air Permit Manager Piedmont Regional Office